CPE 349: COURSE SYLLABUS Winter 2019

Professor: **Tim Kearns**
Office: **14-245**
Office Hours: **Tues, Thurs 11:00 a.m. to 12:00, Weds. 8:30 a.m. to 10:30 and by appointment**
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Prerequisites: **CSC 141 or CSC 348, and MATH 142; or CPE/CSC 103 and MATH 248**

Textbook - Levitin, The Design and Analysis of Algorithms (3rd edition.) On reserve in Library

- Cormen et al., Introduction to Algorithms, 2009 (3rd edition) Sign in through the portal and go to http://site.ebrary.com/lib/calpoly/detail.action?docID=10397652
- Kleinberg/Tardos, *Algorithm Design*, 2005.
- Dasgupta/Papadimitriou/Vazirani, *Algorithms*, 2006. Inexpensive and pdf available at github

Important: Make sure you look over the course plan and the class lecture notes on PolyLearn. These are both tentative and subject to change but are good guides to the course.

Class Structure

Research in learning and cognitive science indicates that active participation significantly improves learning and retention. Learning takes place when people think hard about how to apply the material they are trying to learn. Thus, the course is structured to encourage active and continuous learning. **To do well you should expect to**:

- Since lecture covers only some of the more difficult material and some of the same material sometimes from a different perspective. It is essential to read the text and look over the lecture slides. Suggestions on reading technical material effectively are on PolyLearn.
- Participate in labs. Labs will be time to work on labs, assignments, and homework.
- There will be a discussion board in PolyLearn where you can submit questions about the material. I encourage you to submit questions and **answer other student's questions**. **Active and knowledgeable participation in the discussion board will count toward your final grade.**

Course work

This is a challenging course and we will not be able to cover all the material in class so reading the text and other sources is essential. The best way to learn the material is by solving problems. On exams and quizzes, the problems given will be very similar to: homework problems, assignments, labs, examples from the text, and problems solved and discussed in class. Working together on homework problems is strongly encouraged; however, **you are responsible for being able to solve all problems on your own.**

One of the most effective ways to study is to attempt to solve problems on your own until you are able to solve it without any help. The midterm and final will be **closed book**. For exams you should be able to reconstruct problem solutions and algorithms on demand. This requires an in-depth understanding of the idea behind the algorithm and the ability to translate that into a detailed description of the algorithm. Many students are over confident in their ability to do this. **You need to test yourself by doing this on your own without looking at the solution or any notes.**

Class Expectations and Classroom behavior

During lecture and lab, I will be covering some of the more difficult topics and skills that you need to design efficient and correct algorithms. It is essential that you do the readings and come to class ready to ask questions. By the end of the course you will be expected to be able to write correct pseudo code of the algorithms covered in class and to design and analyze algorithms for problems like those covered in class.

First week to do list:

- ☐ Review carefully the Prerequisites to Know. Make up any deficiencies as soon as possible
- ☐ Read *Resources for Improving Learning*
- ☐ Review the *Links to Sceencasts, Simulations*, etc , these include material you should have learned in either 141 or 348 and materials that will be helpful during the course
- ☐ Review *Pseudo Code Guidelines*
- ☐ *See the Course Plan for reading and exercises for the material that will be covered in the course*

GRADING Exams, assignments, labs, and quizzes can only be made up for a documented emergency. (**Assignments and labs must be submitted on time.** In rare cases I will grant extensions for well documented emergencies. The **lowest assignment grade and lowest lab grade will be dropped**.) Note: The following grade distributions may change during the course of the term.

Assignments/Labs/Quizzes	30%
Final Project	15%
Midterm	15%
Final Exam	40% (Cumulative)

- Exams will be held in the same room as lecture
- Midterm: Tentative Feb 11 (MW) or 12 (TTH)
- Final: TBD during finals week

You are expected to act professionally and respectfully to your colleagues and the instructor. **Electronic devices of all kinds are not to be used during class without explicit permission.** Research has shown use of electronic devices during class impairs the learning not only of the students using them but also other students in the class.

Course Goals

The goal of the course is for you to be able to apply algorithm design paradigms, analyze algorithms, and understand their limitations. PolyLearn has a detailed course description.

Main Course Learning Outcomes
Student should be able to

- Be able to implement and use classical algorithms of computer science.
- Understand the meaning and significance of the problem classes P, NP, NP-complete
- Design correct and efficient iterative, divide and conquer, greedy, dynamic programming and iterative improvement algorithms to solve problems.
- Apply these design strategies to solve problems appropriately.
- Prove algorithms are correct, find counterexamples that show an algorithm is incorrect.
- Analyze algorithms performance analytically and express it in terms of Θ, O and Ω notation.

ADMINISTRATIVE POLICIES

Academic Integrity

Collaboration in lab, homework, and assignments is allowed unless otherwise noted. **However the write-ups of assignments and the actual programming to be handed in must be individual work. (Thus you may not hand in assignments jointly or cut and paste material.)** Quizzes, **final project**, some assignments, and exams are individual work. Collaboration on quizzes or exams is not permitted. Any violation of this policy may result in an F in the course and be reported to Academic Affairs. See the campus statement on Academic Dishonesty: Cheating and Plagiarism

Communications

Email and PolyLearn will frequently be used to communicate important information. **You are responsible for reading these.** You are encouraged to use the discussion boards in PolyLearn. You are also encouraged to use of office hours.

Drop/Withdrawal policy.

You may use CPReg to drop this course any time during the first eight days of class. Carefully evaluate your schedule and determine if you will remain in the class before the end of the add/drop period. After the drop date, "withdrawing" from the course; this requires a documented "serious and compelling" reason, such as a medical emergency.

Students with special learning needs

If you are having difficulty with some aspect of the course due to any special learning needs you may have, I encourage you to contact me. If you have a disability for which you are or may be requesting an accommodation, you should contact me and the Disability Resource Center, Building 124, Room 119, at (805) 756-1395, as early as possible in the term.